OVERGLAZE BRUSHWORK TECHNIQUE APPLIED ON PORCELAIN SURFACES

Abstract

Regular manufacture of porcelain started in Germany in 1713 while started in 1718 in Austria. Josiah Wedgewood from England (1759) and Dmitry Ivanovich Vinogradov from Russia (1748) were the first who studied on porcelain. Plenty of decorating techniques were developed to increase product range in production of porcelain. Increased interest and demand, based upon hand-decorated products being found as a symbol of grace and prestige, provided wide range of studies within this field. Brushwork decorating works applied on glazed porcelain, examined in this study, consist of brushwork decors created on European porcelains from France, Germany and Hungary. Information on the color used in the applications, technical characteristics and patterns are also included.

Keywords: Porcelain, Overglaze Brushwork Decorating, European Porcelain

PORSELEN YÜZEYLERDE UYGULANAN SIRÜSTÜ FIRÇA DEKOR TEKNİĞİ

Özet

görgü ve prestij sembolü olarak görülmesi sebebiyle artan ilgi ve talep bu alanda yapılan çalışmaların geniş bir yelpazede oluşmasına neden olmuştur. Bu çalışmada incelenen porseledden sırtüstü yüzeylere uygulanan fırça dekor çalışmalarında Avrupa'da Fransa, Almanya ve Macaristan porselemleri üzerine geliştirilmiş fırça dekorlarına yer verilmiştir. Yapılan uygulamalarda kullanılan renklere, teknik özelliklere ve desenlere dair bilgiler de yer almaktadır.

Anahtar Kelimeler: Porselen, Sırtüstü Fırça Dekoru, Avrupa Porseleni

Introduction

Porcelain, appears in numerous areas with it’s increasing variety of products along with technical and aesthetic features. This tradition kept alive as an artwork produced for palace for many centuries, became a valuable product for kings, princesses, noblesses in a word, during Middle Ages in Europe; in Ottoman Palace and among its society. It was even described as “White Gold”. Porcelain, accepted as a traditional artwork for centuries, was first discovered by Chinese. It is questionably thought that Europe met porcelain with the occasion of a Venetian traveler, Marco Polo bringing the glorious pieces that he saw during his trips to China. Thus, Marco Polo lead a great deal of attention to Eastern tradition.

First porcelain-making initiative in Europe was made in 1695 in a city of France, St. Cloud. The first product which could be evaluated as a porcelain from a technical aspect, was made by Friederich Böttger in the year 1709 in Meissen, Germany. Böttger created a “hard-paste porcelain” and in 1710, a porcelain factory was established in Europe, which was monopolized by August, King of Saxony. Consecutive factories in Europe increased the quality of their production, in this way they reached a position of competing with Chinese porcelain.

Porcelain surfaces, generally considered as a toile, provided a background for hunting scenes, miniatures, landscapes, religious scenes, scenes from daily life and predominantly, naturalist and botanical illustration. It inspired many artists with its perfect white and transparent appearance. Color variations were increased through paints obtained as a result of long and exhaustive working, thus it became possible to tone just like an oil painting. Increasing demands and tastes have lead to different decor styles. Herend, Meissen and Sévres porcelains head it up, especially in hand-decorated ones.

Dining tables which prepared meticulously, have been a part of the culture of the elite for centuries and they have furnished surroundings with nice handmade objects. Today, there is variety of products ranging from home decoration, kitchen utensils, dining tables to medical supplies. Ease of use, its importance in terms of health, being stylish and elegant, appealing to many tastes, and growing improvement of diversity increase the interest in porcelain.

A great enthusiasm for Eastern tradition was born as a result of Europe meeting Chinese porcelain. Many factories were established and increase in quality was achieved with numerous productions. They reached the position to compete even with Chinese porcelain. This development has been observed in decoration and many factories have their own decorating applica
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Considering them as a team, many artists working at factories such as pattern-maker, glazier, painter and sculptor also contribute this diversity. Factories were established, where notable artists worked, not only in France, Germany and Hungary but also in United Kingdom, Italy, Russia, the Netherlands, Denmark, Poland and Turkey. Productions showed qualifications that prove which factory they belong according to the forms and decoration. Some factories are currently in production. The most significant brushwork genres are Sèvres, Meissen and Herend porcelains, especially in decoration.

Overglaze Brushwork Decor Applications and Materials

Bisque and glaze firing are processed to apply overglaze decorating on glazed surfaces. Firing needs to be done for the third time to provide color fixing after decorating process applied on the glazed surface. Although overglaze decors are generally applied on products that glaze firing made, various decorating techniques can be applied on the ones with high bisque temperature with overglaze paints on artistic purposes in order to make the appearance more aesthetic (Sevim, 2007: 47).

Porcelain, which is the most important and precious ceramic, is mostly defined with concepts as non-porous, fine, thin, white and translucent. It is examined under two major groups: Hard-paste porcelain and soft-paste porcelain. Both types of porcelain take place in Kaolin-Feldspar-Quartz system. Hard-paste porcelain is richer in kaolin while being poor in feldspar than soft-paste and it is fired at high temperature” (Arcasoy, 1983: 130).

Two basic types of materials, overglaze paints and resinate lustres are used in overglaze decorating which is applied on porcelain surface. When materials as brush, sponge etc. are used in freehand decoration, other equipment such as sieve, silk etc. are needed for serigraph printing. This study discussed brushwork decorations with overglaze paints.

Overglaze Paints

Ceramic paints applied as onglaze, underglaze or inglaze are colorants which are obtained from various metal oxides. Intended paints are generated with following metal oxides and related components:

“Antimony oxide; yellow and yellow shades, chromium oxide; yellow, green and red tones, cobalt oxide; blue, black and pink tones, copper oxide; green, turquoise, shades of red in reducing atmosphere, ferric oxide; yellow, red, red brown, brown, black in reducing atmosphere, manganese oxide; purple, brown, nickel oxide; gray, blue and pink, uranium oxide; yellow, red, orange and black, iridium compounds; black, gray, gold compounds; pink and shades of red, and platinum compounds color gray, black and dark smoke” (Sevim, Seramik Dekorları, 2003:225).
Various paint companies produce decorating paints in order to support the ceramic industry, as it is hard and challenging for manufacturers to obtain ceramic paints from mentioned metal oxides.

Overglaze decorations, as the name implies, are decorating techniques applied after glaze firing. A third firing is needed to fix paints, which produced in accordance with this decor technique, after the application.

Overglaze decors are usually fired between 700—890 °C and they have a wide color palette by comparison with high temperatures (1100-1380°C) of inglaze and underglaze decorations. There is almost no limitation for choice of color (Saunders, 2007: 47).

“Frits, used as solvents in overglaze paint production, are glasses which are able to melt in low temperature and liquify paints fulgently on the glaze surface. These solvents are SiO₂, B₂O₃, PbO, and alkalies. SiO₂ is used in low proportions while others used in higher. During the preparation process, paints and solvents can be milled dryly by being mixed proportionately after prepared as separate while they can also be grinded after melted together. Overglaze paints can be created by grinding the rates being as 25% Paints, 75% Solvents (70 units of red lead, 15 units of borax, 15 units of silisium). This is a general rate. This ratio may change according to the paint color, shade and solvents” (Sevim, 2007: 147).

Overglaze paints are usually in powder form for brush decors. Today, kind of an organic oil, named medium is used in order to temper powder paints to achieve desired consistency while formerly organic oils as pine turpentine oil and glycerin have been used. Medium provides paint to fix on the texture. They are divided into two groups as water-based and solvent-based medium.

“The rate of the paint to medium is generally accepted as 100 gr. Medium, 50 gr. Paint” (Sevim, 2207: 47).
Prepared paints should be stored the way that prevent drying after the use. Lavender, anise or clove oil is added in small amounts during the process. These oils must be pure. Turpentine is also used as a thinner. The paint is never grinded with medium if composition applied to the surface will be cooked and colored, turpentine and a thin dip pen are used in this case.

It is necessary to use a little more oily paint during drawing a line with a brush. Oils as medium-mx54 and lavender are suitable for this process. The amount of the oil is important as colors pink and purple reject extra oil due to the gold they contain, while it is proper to use more oil for dark colors as green. A small amount of medium is used, if more vivid color is desired. However, as preparing the paint quite densely may cause failings as blisters, aggregations, burning and detachments from the surface, it is essential to balance the percentage of paint, medium and other oils. In addition, loss of gloss may be experienced after the firing, in case of using medium inadequately while permeation is possible on the contrary. Color toning of the paints can be obtained with increasing and decreasing amounts of medium and oils. Color tones of the overglaze paints, in wet form and fired, are generally the same. On the other hand, experiments must be performed very carefully, as colors like red and orange will show an alteration based on the atmosphere of the furnace.

Brushes used for brushwork decor have a large variety. There is iron in the color of red, chromium in green and cadmium in yellow and its shades. Some colors counteract the other color they applied on, in case mixed, because of the chemicals as cadmium they contain, and it causes obtain a quite lighter color than desired. Color yellow, especially, should not be mixed with the other colors except blue and green. Different tones can be achieved by mixing all other colors with each other. However, mixing process should be performed after weighing each paint in order to obtain the same color, if these accent colors will be used again. Another noteworthy point for using overglaze paints is the glaze color of the application surface. Color yellow used for a black-glazed surface, for instance, may turn into oil green after firing. Overglaze paints should be fired privately and separate from bisque or glaze firing. In the contrary case, it is possible to experience loss of gloss.

**Binders and Diluents**
Clove Oil; This oil which is distilled from carnations, is used to make paints remaining operable much longer. Paints are preserved from drying through lavender, clove and anise oils splattered with a syringe.

Medium; This special oil, which is a mixture of other oils, is sold as a finished product.

Turpentine; This oil, obtained by distilling mastic, is used to thin paints. It also is usually used for cleaning brushes. Brush is prevented from hardening by saturated in oil. If brush is hardened, it still can be softened with a small amount of turpentine essence. In addition, orange oil is also used to prevent brushes from drying out.

Thinner; It is used for thinning noble metals, dense consistency in other words. It is appropriate to use a separate brush for the thinners and they should not be mixed with other paints.

Medium; This special oil, which is a mixture of other oils, is sold as a finished product.

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Plate 4: Oils and binders used in overglaze decor technique

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Brushes

High-quality brushes must be chosen for overglaze hand-decoration applications. Weasel or squirrel hair brushes should be preferred especially for porcelain painting. There are basically five kinds of brushes used for applications.

Painter Brush; They are used to fill all small areas. Plenty of types of these brushes are needed for insignificant curvatures or straight lines.

Tinting Brushes; These brushes, which are used as a filler, will be needed to dye background, surface in other words. These are long, soft bristle brushes.

Angular Shader, Filling Brush; These long, oblique types of brushes are used to draw lines or stripes. Some brushes should be kept separate for custom metallic colors and gold. The same brush should not be used for more than one color and gold.

Pointed Tip Brushes; They are usually used for shading and nuance. Different sized brushes are used.

Outer Contour Brushes; High grade contour brushes are recommended for detailed drawing of flowers and feather. You will need 0.00 and 1.
One of the leading companies that produces and sells brushes, specially designed for overglaze brushwork decorating on porcelain, is “Westfield House” in United Kingdom. Some of the products can be seen in Plate 5, 6, 7, 8, 9, 10 and 11.

Plate 5: The brush used for shading
http://www.westfieldhouse.co.uk/index.html

Plate 6: The brush used for the construction of the rose
http://www.westfieldhouse.co.uk/index.html

Plate 7: The brush used for drawing small leaves and flowers
http://www.westfieldhouse.co.uk/index.html

Plate 8: The brush used in tree drawing
http://www.westfieldhouse.co.uk/index.html

Plate 9: The brush used in branch drawing
http://www.westfieldhouse.co.uk/index.html

Plate 10: The brush used for drawing the details
http://www.westfieldhouse.co.uk/index.html
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Plate 11: The brush used for background painting

http://www.westfieldhouse.co.uk/index.html

Other Materials and Equipment Used for Overglaze Decorating

Various ancillary tools and equipment (Plate 12) are used in overglaze brushwork technique. Some of these tools are as follows;

Agate Stone Polishing Tool; This tool which has an agate stone on its head is used to polish gold.

Gold Eraser; It is used to remove imperfect gold after firing.

Tracing Paper; It is used to transfer the drawing onto porcelain surface.

Glass Containers or Jars; This glass containers will be needed to store powder paints, gold, various oils and brushes.

Glass Rod; It is used to make subsided gold functional, mix in other words.

Plate 12: Brushes used in overglaze decorating technique.

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Graphite Paper; The pattern is transferred onto the surface through this carbon paper, which is put under the composition drawn on tracing paper.

Line Drawing Apparatus; There are many holes on this tool particularly suitable for hollow forms as plates and bowls. Line is drawn through this apparatus fixed on the form and a pen, pinned among desired ranges on the holes.

Paper Template Split Into Dies; Center point of the decorating object is determined with this paper and requested spaces are transferred by determining on the paper. Equal dies are created through paper separated into several cm intervals.
Palette; Porcelain or ceramic tiles can also be used as a color palette. One tile is used to prepare colors as the other is for laying prepared colors together.

Palette Knife, Spatula; It is preferable to have flexible-tip. Thus, it is easier to mix paints on the tiles or transfer from one place to another.

Soft-Tip Pen; Pattern is fixed to the surface by using lithography pen. It is removed from the structure by burning, after firing.

Scraper; Toothpick, knife or dental equipment are used to clean effused regions on the pattern.

Banding Wheel; It is hand operated and used to center the object on the disk for drawing tapes.

Application of the Overglaze Brush Decorating Technique

Glazed porcelains are used in the applications. Surface being cleaned is important to decor before the overglaze decorating application. The surface should be cleaned with absolute alcohol before start working. In addition, failings during the application can be arranged by using absolute alcohol and thinner. Motif-pattern which will be worked is transferred onto the surface through a carbon paper (Plate 6), then it is drawn with a soft pencil or a dip pen (Plate 24).

Plate 13: Pattern transferred with carbon paper

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This floral bouquet created with naturalist style is one of the best known examples of Meissen. Pattern transferred onto the surface is colored with outlines and first firing is performed. At least two firings are needed to detail the pattern (Plate 14, 15, 16, 17, 18).

1 These are the first hard-paste porcelains in Europe. It was established by Friedrich Böttger in 1710, thereafter the researches conducted by Ehrenfried Von Taschinhaus, who was a alchemist trying to create gold with the directives of the ruler of Saxony, Augustus, in 1708. First products of the company founded in 1710 were red paste. This period is mentioned as a Böttger period. Production of the original white porcelain started beginning from 1713. The first production consisted of China effectively, weakly decorated objects. The period of classic Meissen started at 1723 with the production of versicoloured, gold star decorations. Influence of Chinese and Japanese porcelains continued during this period as early times.
Patterns worked in applications of overglaze brush decorating can be performed with several firings. Two firings were performed to create fine details as seen in this study. Details are worked and application is finished with a second firing after coloring outlines. Performing six firing processes is possible in overglaze decorating technique to work with pattern effectively and prevent top and bottom paints from affecting each other (Plate 9, 10, 11).

Plate 14: The work with colored outlines.
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Plate 15: The work with painted details
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Plate 16: The work with colored outlines.
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Powder paints are prepared by using more oil in comparison with the other techniques, in the study conducted with American\(^2\) technique. Paints should be about the consistency of toothpaste. Prepared paints are necessarily stored in a box to prevent drying. Application of American technique is similar to oil painting. Background is created as no whiteness found on the surface. Ground is covered with shades as applied pattern is being practiced. These studies, requiring at least two firings, can be exposed to six in terms of allowing more detailed views (Plate 19, 20, 21, 22).

\(^2\) American technique is a technique performed with nondrying oils. It is operated with square and stubby brushes and used in impressionist works with a watercolor effect. Patterns are elicited with shadings and ground is used to bring out the flowers. Consequently, patterning is performed as no white areas left on the structure. It rose in Limoges, France. Today, it is practiced in North-South America. It requires at least three or four stages of firing. Various plants and creatures are tried to be reflected as in nature in this technique practiced in a naturalist style. These works, which are developed both with staying faithful to anatomical features of all creatures live in nature and lightning and shadowing, have a lively view, almost palpable. All colors found in the nature are used. Many toning take part in this technique, which also involves monochrome works. However, mixing colors change based on materials they contain, their consistence and firing process although there is an ability to create unlimited colors in porcelain paints.
Plate 19: Rose Bouquet; pattern transfer

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Plate 20: Rose Bouquet; shading

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Plate 21: Rose Bouquet; shading

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Plate 22: Rose Bouquet; shading

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Victoria, a classic Herend pattern consists of stylized flower bouquets and butterflies. Pattern transferred to surface with a carbon paper is made ready for drawing. Contour is drawn with a dip pen and first firing is performed at 700-800°C after grinded black powder paint is prepared with turpentine. Pattern is colored and second firing is performed. (800°C)

Plate 23: Pattern drawn with a dip pen
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Plate 24: Pattern colorization
Gamze Görgünay Personal Archive

3 There is an extant manufacturing shop, with the tradition of hand-painted porcelain production, established in a small Hungarian village, Herend, in 1826 and it became world’s most important porcelain center. Herend and Hungarian porcelains significantly contributed to industrial and social development of the country during the 19. c. Porcelain was imported from China until the 17. c. Experiments had been made in Europe for centuries until it was noticed by Johann Friedeich Böttger and other porcelain factories as Meissen was established. One of the by-products used in these experiments is faience tile, which is named after Faenza, Italy. Production of the faience, resembles porcelain due to appearance and physical quality, has an important place in the development of Hungarian ceramic industry. First experimental porcelain products were manufactured in studios founded in places as Holics, Tata, Papa and Hollohaza. Porcelain factories in Europe were mostly established by princes or kings. It has maintained its importance as a valuable material for centuries. However, porcelain industry was found in Hungary by an entrepreneur at this time rather than a noble. Herend’s founder was a plebeian, Vince Stingl. Business, not capable of competing with foreign goods evolved into a studio which was able to produce at industrial level with Mor Fischer purchasing the company in 1840. Thus, Herend porcelain has been one of the very popular export products so far.
RESULT

Preparations and implementations of paints differed due to contained chemical components. Although each paint shapes at different temperatures, the ideal temperature for all colors was determined as 800°C and firings were accordingly performed. For instance, colors as cobalt, pink, purple which contain gold shape in 800-850°C. Colors as yellow and red, that contain cadmium, fade away in case exposed to higher temperatures than 800°C. Cadmium is an element which is used to make fusible alloys and to prevent surfaces from oxidation in steel production while it also provides a metallic lustre. Yellow cadmium is used in paints as cadmium sulfide as the mixture of cadmium sulfide and selenite are used to obtain the tones of yellow-red. Therefore, the use of the color yellow is quite risky because of the cadmium it contains, which is a white, bright element. All overdyed colors disappear after firing. Accordingly, it is only used separately or mixed with shades of green and gray for shading. It was observed that color red turned into brown in the event of exceeding desired temperature.

Oils may vary according to the brushwork decoration style desired to be applied on overglaze surface. For example, nondrying oils are used for American technique which requires a long process and duration. Firings is generally performed at four stages for applications in which this technique is used. There are lavender, clove and mineral oils in its composition. Medium is used for all other techniques and desired amount of lavender and clove oils are added afterwards. The amount of oil, which is used to increase consistency, is important if color pink or purple will be used. Over-supplemental oil causes paint dry late as it contains gold and consistency becomes more fluid. Amount of the external medium should be less as gold contains oil itself. Temperature of the furnace is a point to take into consideration for using virgin gold in the forms. Temperature is gradually increased for the first hour in order to prevent discoloration or cracks.

It was aimed to create resource for researchers, who wants to examine and apply related techniques, with this study which analyzes overglaze brushwork decoration technique applied on porcelain surfaces.

RESOURCES


Marr-Hartmann, M. PorzellanmalereiGraser, Kafer, Schmetterlinge. Germany: Callwey.


